APPENDIX I (EARNED VALUE ANALYSIS CONTINUED)

This appendix provides instructions on how to complete an earned value analysis. Developing an earned value analysis is premised upon the completion of a well-developed project plan. The information required to complete an earned value analysis includes:

- Project title;
- Project tracking number.
- The identification of critical path milestones;
- Budgeted % of work performed for each critical path milestone;
- Planned critical path milestone start and completion dates;
- Budgeted dollars for work performed for each critical path milestone;
- Project start and end dates

Be sure to attach the following documents to the completed Application:

| Deliverable	Directions
Earned Value Template	Print/Attach a copy of completed earned value template to the application.
Project Plan	Attach copy of completed project plan.
Progress Reports	As critical path milestones are completed.

The Project Plan, at a minimum, should include:

- Project Title and Tracking Number
- All Critical Path Milestones (CPM)
- Budgeted % of work performed for each CPM
- Planned start and completion date for each CPM
- Planned expenditures for each CPM
- Total Project Budget
- Planned Project Start and End dates

Overview

Earned value is a planning and budget summary tool, which identifies expenditure and scheduling projections for established critical path milestones. Critical path milestones represent a significant point in the development of a project, where the initiation of each milestone is dependent on the completion of a prior milestone (a linear process). This tool gives a project manager the ability to track actual project progress and expenditures at the completion of each critical path milestone, against planned figures, which results in project variances. These variances can be used to identify schedule and cost overruns so that they can be resolved as quickly as possible.

Earned Value utilizes projections derived from a completed project plan (in accordance with OMB Circular No. A-11, Appendix 300C, 1999), to create a tracking and evaluation system that allows the project manager and VA to assess a given project's progress. The tool is linear, tracking project milestones, one after another.
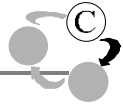
It assumes that each phase is completed prior to the start of another phase.
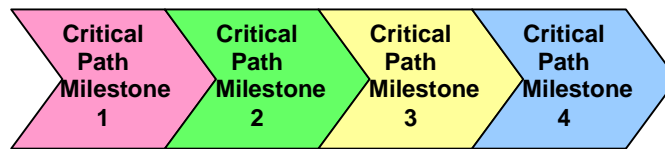
The Process

Earned value incorporates four variables in measuring a project's ability to stay within the planned budget and schedule. These four variables (critical path milestones, % of work performed, schedule and budget) are estimated during the proposal stage – within the Earned Value Template. Those estimates are derived from the proposal's project plan, which should detail the project's various stages. The Capital Investment Board, during the Capital Investment Methodology process evaluates and adopts the earned value plan, when approving and allocating project funding.   Only Earned Value projections are needed to complete the Earned Value task for the proposal stage.

However, Earned Value is a tool that is used throughout the project lifecycle. Once the project is approved and funded, project tracking begins based upon the critical path milestones, total daily effort, schedule and budget figures established during the proposal stage of the process. As the project approaches the completion of each critical path milestone, the *planned* are compared to *actuals* for each of the variables.

After the project begins, VA and the project manager exchange information, at the completion of each critical path milestone, to determine project progress. This tool allows VA and project managers to identify concerns before they threaten project completion.

Complete the Template

This template consists of 2 separate worksheets. The first, "Earned Value Analysis" is designed to assess performance at the conclusion of each critical path milestone. The second, "Planning Report" allows the project manager to calculate the earned value of work performed at any given time prior to completion of a milestone. It also provides forecasts of projected expenditures and labor efforts. Combined, these two worksheets allow the project manager a quick and simple method of assessing work performance. If a more comprehensive assessment is required, Microsoft Project® allows project managers to develop detailed project plans and monitor them throughout their completion.

Getting Started

Step 1. Open the file titled Earned Value Template.xls

Step 2. Go to the worksheet Earned Value Analysis. On this sheet you will fill in ONLY the light blue fields during the initial phase. Later you will complete the yellow cells.

Step 3. At the top of the sheet, input the Project Title and Project Number. These should be found on the proposal application.
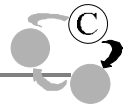
Step 4. Input the planned Project Start Date and End Date. Below these cells is a cell for the current date that is automatically generated by Excel and will be used in various calculations. Do not attempt to input data into this cell. To the right of these dates are two dark blue fields with white text. The top cell calculates the total budget for work to be performed. The information is derived from Column H. The lower cell is the total cost of work performed as of the most recent completion of a critical path milestone. The information is derived from Column J. These cells are automatically generated and should not be changed.

Input Initial Proposal Information

Input information into the light blue cells of the worksheet as specified in the Description column below:

Column	Title	Description
A	**Critical Milestone**	Input a brief description of the Critical Path Milestone as specified in the project plan.
B	Budgeted Percentage of Work Performed	Input the estimated percentage of total project work allocated to the specific milestone. For example, if you estimate that to complete this milestone will require 10 percent of the total project effort, you would input a "10" in this cell. The total of all cells in this column should add to 100 percent. This can be checked in Cell B594.
E	Planned Start Date	Input the anticipated start date for the milestone in the standard date format MM/DD/YY.
F	Planned Completion Date	Input the anticipated completion date for the milestone in the standard date format MM/DD/YY.
H	Budgeted Dollars for Work Performed	Input the amount (in dollars) budgeted for completion of the specified milestone. The total of all milestones, and the total allocated for the entire project will appear in Cell H6.

You will return to this worksheet later to input additional information in the yellow boxes.
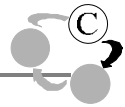
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One example for an IT project might include:

| Critical Milestone	Budgeted Percentage of Work Performed	Planned Start Date	Planned Completion Date	Budgeted Dollars for Work Performed
Completion of the Requirements Analysis	8%	03/30/2000	04/30/2000	$750,000.00
Completion of Data Modeling	8%	05/1/2000	06/01/2000	$750,000.00
Completion of System Design	40%	06/02/2000	10/24/2000	$5,000,000.00
Completion of Implementation	19%	10/25/2000	1/10/2001	$2,000,000.00
Completion of Testing	10%	1/11/2000	2/20/2001	$750,000.00
Completion of Training	15%	2/21/2001	4/15/2001	$750,000.00

while a construction example might include:

Critical Milestone	Budgeted Percentage of Work Performed	Planned Start Date	Planned Completion Date	Budgeted Dollars for Work Performed
Architectural and Infrastructure Review	5%	05/15/2000	06/06/2000	$600,000.00
Legal and Environmental Review	5%	06/07/2000	07/01/2000	$600,000.00
Award Construction Contract	1%	07/02/2000	07/06/2000	$10,000.00
Mid-Point Review of Construction	40%	07/07/2000	12/20/2000	$4,800,000.00
Completion Review of Construction	40%	12/21/2000	5/30/2001	$4,800,000.00
Space Deliver/Occupancy	9%	06/01/2001	07/10/2001	$1,100,000.00

Remember that the critical path milestones used to complete the earned value analysis are directly derived from the project plan. These are the milestones that require completion before another milestone can begin.

Monitoring Project Performance during Milestone Progress

Select the worksheet *Planning Report*. You will notice that certain pieces of information have carried over from the *Earned Value Analysis* worksheet including the Critical Milestone, Planned Completion Date, and Budgeted Dollars for Work Performed. These latter two are important since they will serve as benchmarks for monitoring performance.
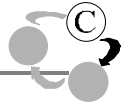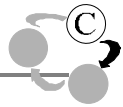
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Column A contains milestone status information. All cells in this column should initially be set to read "Not Started". If this is not the case, select Cell A12. From the pull-down list, select "Not Started". Highlight the cell and drag from the lower right corner down throughout the column to Cell A593. All cells in Column A should now read "Not Started". Now set the first milestone status in Column A to read "In Progress" from the pull-down list in Cell A12. When the milestone is complete, you will change the status to "Complete" from the pull-down list, and set the next milestone status to read "In Progress". Since this template monitors the Critical Path Milestones, you will monitor only one milestone at a time.

At some point you will be requested to generate a Progress Report. To do this, you will input two pieces of information in Columns L & M. On this worksheet, you will input information ONLY in the gray fields. Input information into the gray cells of the worksheet as specified in the Description column below:

Column	Title	Description
L	Percentage of Work Performed to Date for Milestone	As of the date of the report generation, estimate the percentage of work completed for the specified milestone. For example, if you estimate that 60 percent of the work toward the first milestone is complete, input a "60" in the cell.
M	Dollars Expended to Date for Milestone	As of the date of the report generation, input the number of dollars expended toward completion of the milestone. For example, if $500,000 have been spent (not obligated), you would input "500,000" in the cell. If contractor labor is being used, calculate monies spent as follows:

Fixed Price Contract: Multiply the percentage in Column L by the Budgeted Dollars for Work Performed in Column I. Fixed price generally implies a direct correlation between expenditures and level of effort. Cost overruns will require adjustments to appear in Column J of the *Earned Value Analysis* worksheet.

Time and Materials Contract: Multiply the varying rates for labor against the hours billed for each category to date. This provides the current level of direct expenditures. |

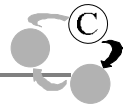**APPENDIX I (EARNED VALUE ANALYSIS CONTINUED)**

Once these data have been input, several pieces of information will be generated automatically. These are described in the table below:

Column	Title	Description
N	Forecast Level of Actual Effort for Milestone	This is a forecast based upon linear interpolation of progress to date. A forecast below 100 percent implies that you are presently ahead of schedule and expect to complete the milestone using less effort than originally budgeted. Over 100 percent means that you are expected to expend more labor than originally budgeted by the number of percentage points over 100.
O	Forecast of Actual Cost of Work Performed for Milestone	This is a forecast of total spending on milestone based upon a linear interpolation of spending to date. In other words, it is what you can expect to spend to complete the milestone based upon what has already been spent.
P	Forecast Percentage of Actual Cost of Work Performed for Milestone	This is a percentage calculation of Column O. It is a forecast of the expected percentage level of budgeted dollars to be spent to complete the milestone.
Q	Earned Value of Work Performed for Milestone	This is calculated by multiplying the Percentage of Work Performed to Date by the Budgeted Dollars for Work Performed. It is the dollar value of work already performed based upon the original budget for the individual milestone.
R	Current Earned Value Balance for Milestone	This is the difference between Column Q and Column M or the difference between the Earned Value of Work Performed and the Dollars Expended to Date for the Milestone. It is a measure of the current surplus or deficit of spending on the milestone.
S	Anticipated Milestone Completion Date	Based upon current progress of work performed, this is a forecast completion date for the milestone.

As progress occurs, Columns L & M will be updated with the most recent information until the milestone is complete. At that point, change the status indicator in Column A to read "Complete". Return to the worksheet *Earned Value Analysis*.

Analyzing the Milestone

You will now complete the yellow sections on the *Earned Value Analysis* worksheet as follows:
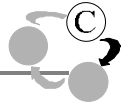
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Column	Title	Description
D	Actual Percentage of Work Performed	This is a percentage of the total project effort expended to complete the milestone. This can easily be calculated as follows: When Column L of *Planning Report* worksheet equals 100 percent (milestone is complete), take the value of Column N on the same worksheet (Forecast Level of Actual Effort for Milestone) and multiply it by Column B on the *Earned Value Analysis* worksheet (Budgeted Percentage of Work Performed). For example, if the resulting value of Column N of the *Planning Report* is 87% when the milestone is complete, and the Budgeted Level of Effort (Column B) of *Earned Value Analysis* is 15 percent, the resulting Actual Percentage of Work Performed is 13.05 percent.
G	Actual Completion Date	Input the date of completion for the milestone.
J	Actual Expenditures	Input the total amount of monies expended to complete the milestone.

Once these data are inputted, certain pieces of information will automatically be generated. These are columns shown in gray and described below:

Column	Title	Description
P	Individual Milestone Variance in Budgeted Work Performed	This is a percentage calculation of surplus or deficit of effort expended for individual milestone. A positive percentage indicates that the level of effort expended was less than the effort that was originally budgeted. A negative value indicates the opposite.
Q	Sum Variance of Budgeted Work Performed	This is a percentage calculation of surplus or deficit of effort expended for the entire project. A positive percentage indicates that the level of effort expended was less than the effort that was originally budgeted. A negative value indicates the opposite.
R	Individual Milestone Variance in Budget	This is the surplus or deficit of expenditures for the individual milestone.
S	Sum Variance in Budget	This is the surplus or deficit of expenditures for the entire project.
T	Percentage Budget Variance for Individual Milestone	This is a percentage calculation of the surplus or deficit of expenditures for the individual milestone.
U	Sum Percentage Budget Variance	This is a percentage calculation of the surplus or deficit of expenditures for the entire project.
V	Days Variance from Schedule	At the completion of each milestone, this is a measure of the days ahead or behind in schedule for the entire project. A positive value indicates a project that is ahead of schedule, a negative value indicates a project that is behind schedule.

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It should be emphasized again that this template is designed to evaluate milestones in the critical path only, therefore each milestone must be completed before the successive milestone can begin. However, the data should be collected and monitored for each milestone throughout the project to achieve maximum effectiveness.

Print a Progress Report

By selecting the *Planning Report* you should be able to print a progress report directly from the screen. The sheet has been formatted to contain all necessary information in successive sheets. HOWEVER, due to hidden columns, a full print without selecting relevant pages will result in over 240 pages of print. It is suggested that Print Preview be used to verify the print selection.